Controlled atmosphere storage of mango fruit - an overview

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Abstract

Highly perishable nature of mango fruit and its susceptibility to chilling injury when stored below 13°C limits its international trade. Cold storage of mango at 12-13°C is successful only for 2-3 weeks coupled with substantial losses in fruit quality. Controlled atmosphere (CA) in combination with an optimum storage temperature has been reported to prolong the storage life and maintain fruit quality including aroma volatiles in mango fruit depending upon cultivar. Fruit quality is an important factor in influencing consumer preferences in international and domestic markets. This paper will focus on fundamental and applied aspects of CA storage of mango fruit and its implications in facilitating international trade. Various researchers have attempted to optimise CA conditions for different cultivars of mango as the CA requirements of mangoes vary among cultivars and inappropriate CA conditions adversely affect quality of ripe mango fruit. CA comprising of low O_2 concentrations (<2%) has been reported to accumulate ethanol and adversely affect fruit quality of 'Tommy Atkins' and 'Delta R2E2' mangoes. For about a decade, my research group has been exploring the effects of CA on extending storage life, maintaining fruit quality including aroma volatiles production in mango fruit. CA storage comprising 3% O_2 in combination with 6% CO_2 at 13°C seems to be promising for extending the storage life of the Australian mango cultivars 'Kensington Pride' (KP) and 'R2E2' up to six weeks, with good fruit quality and maintaining a high concentration of the major volatile compounds responsible for the aroma of ripe mangoes. The applications of CA in preventing chilling injury, postharvest diseases and insect disinfestations have also been discussed.